

VOLUME 3

ENVIRONMENTAL LIVING:

PROTECTING THE ENVIRONMENT...

WHEN BUILDING OR BUYING YOUR DREAM COTTAGE



MINISTRY OF
ENVIRONMENT AND ENERGY

Ontario

TABLE OF CONTENTS

ENVIRONMENTAL LIVING: PROTECTING THE ENVIRONMENT ... WHEN BUILDING OR BUYING YOUR DREAM COTTAGE

Before You Take the Plunge: Rural Life is Different

Are you prepared to provide your own basic services?	6
Are you prepared for the lack of social/municipal services?	7
Are you prepared to blend in with the neighborhood?	8
Are you prepared to live closer to nature — and let it live closer to you?	8
If Environmental Living is New to You...	8

Bylaws and Buildings: Unravelling the Red Tape

Land Use Planning and Official Plans	9
Zoning Bylaws	9
Interested in Land in Northern Ontario?	10
The Process is a Little Different ...	10
Other Authorities to Check Out	11
Getting the Right Permits	12

Dig a Well to Tap into Groundwater Supplies

Whither Your Water?	13
What Type of Well?	14
Where Should You Locate Your Well?	15
Hiring Help	15
Pumping Water to Your Cottage	16
A Word on Keeping Your Well Healthy	17
More for You to Read	17

This is a Story about Sewage. Don't Skip It or You'll Be Sorry.

Submit an application for your septic system	19
Arrange for your lot to be inspected	19
Apply for your building permit and build the septic system and your cottage	20
Arrange for a final inspection	20
More for You to Read	20

Cottage Landscaping You Can Live With

Landscaping to Encourage Wildlife	22
Shrubs for Wildlife	22
Work with Your Site When You Landscape	23
Getting Help	24
More for You to Read	24

More for You to Read 25

ENVIRONMENTAL LIVING:

PROTECTING THE ENVIRONMENT...

WHEN BUILDING OR BUYING
YOUR DREAM COTTAGE



For additional copies of this volume, contact:
Ministry of Environment and Energy
135 St. Clair Avenue West
Suite 100
Toronto, Ontario
M4V 1P5

ISBN 0-7778-1068-9 (5 v. set)
ISBN 0-7778-1071-9 (v. 3)

PIBS 2317E

 Ontario



ABOUT "ENVIRONMENTAL LIVING"

W

ould you like to do something to help the environment — but do you feel overwhelmed by the magnitude of the problems? Do you wonder if your efforts as an individual can make a difference?

Take heart. "Environmental Living" was written for all those people who want to protect the environment but need to know how and where to get started.

The pages of "Environmental Living" describe how to conduct your everyday activities in ways that are environmentally friendly. It's a "primer" on environmental topics that affect people who live in the city, people who live in the country and people who spend time in the great outdoors. Everything is explained in simple, easy-to-understand, easy-to-remember language.

Do you want to know how to cut down on the garbage you generate? How to start a compost heap? How to drive your car to improve its energy efficiency, lengthen its life and reduce the pollution it creates? "Environmental Living" shows you how easy it is to do all these things.

Do you live in the country — or are you thinking about buying a cottage or rural property? Do you want to learn how to look after your septic tank system? How to test for bacteria in your well water? How to build an environmentally friendly dock? "Environmental Living" looks at all these topics, and more.

Do you spend a lot of time in the great outdoors? Do you want to know how to avoid insects? What to do about zebra mussel infestations in the Great Lakes? If it's safe to eat that fish you caught? "Environmental Living" has the answers.

Living environmentally doesn't mean you have to become an environmental expert. You don't have to spend a lot of money or time. Nor do you have to make wholesale changes to your life.

No single, dramatic act by one person can save this planet. But all of us, doing a lot of simple, commonsense things, *can* save it — a little bit at a time. •



WHAT YOU'LL FIND IN "ENVIRONMENTAL LIVING"

"Environmental Living" is an unusual concept in publishing. It is one book, but it is published in five separate sections. You, the reader, decide which topics you want to read about, and you need order only those sections.

This means "Environmental Living" uses less paper, and you, the reader, don't have to wade through pages and pages of information you don't need.

To order any section of "Environmental Living", contact the Ministry of Environment and Energy by telephoning the Public Information Centre in Toronto at (416) 323-4321 or toll-free at 1-800-565-4923.

Each section of "Environmental Living" consists of several chapters that share a common theme. Every section and chapter is self-explanatory but, as you read them, you may come across references to other sections or chapters that can give you related or more detailed information. Those sections and chapters will be referred to by their complete titles, to make it easy for you to order that section.

At the end of each chapter is a list of publications you may want to read to get even more detail or technical background information; there's an explanation of where and how to obtain copies of those publications.

Here's a list of chapters in each section (a description of the chapter's contents follows, in brackets). •

Environmental Living:

Protecting the Environment ... in Your Home

There's information of interest to everyone in this section, which has chapters about handling waste, non-toxic cleaning, how to drive to minimize pollution, and what you can do about global issues such as acid rain and global warming.

- "What a Load of Garbage!" The 3Rs
(Describes the 3Rs and what to do with your garbage);
- The 3Rs, Take Two: Little Things Mean a Lot
(Quick tips on practising the 3Rs);
- Cleaning Without Chemicals: Recipes for a Non-Toxic Planet
(Making your own non-toxic cleaning products);
- Cleaning Without Chemicals, The Sequel: The Non-Toxic Cleaning Kit (Quick cleaning tips);
- Not Down the Drain: What to do With Household Hazardous Waste
- Water, Water Everywhere
(How to conserve water);
- Your Car and the Drive for a Healthy Environment
(How your driving habits affect the environment);
- Good News about Acid Rain
- Global Warming: The Gloves are Off
(What you can do about global warming). •

WHAT YOU'LL FIND IN "ENVIRONMENTAL LIVING"

Environmental Living: Protecting the Environment ... in Your Yard and Garden

Do you want environmental tips you can put into practice in your backyard? Read these.

- A Down-to-Earth Guide to Composting and Vermicomposting
- A Grassroots Look at Your Lawn (Growing a lawn that looks after itself);
- Those Pesky Bugs! And Other Small Hazards of the Great Outdoors (Controlling insects);
- Using Insecticides Safely
- Too Close for Comfort: What to Do About Nuisance Animals. *

Environmental Living: Protecting the Environment ... when Building or Buying Your Dream Cottage

If you are buying a cottage or rural property, read these.

- Before You Take the Plunge: Rural Life is Different (Adjusting to country living);
- Bylaws and Buildings: Unravelling the Red Tape (Building and zoning laws and permits);
- Dig a Well to Tap into Groundwater Supplies (How to construct a well);
- This is a Story about Sewage. Skip It and You'll Be Sorry (Disposing of sewage when there's no municipal sewer system);
- Landscaping You Can Live With (Landscaping to protect and blend into the environment and to attract wildlife). *

Environmental Living: Protecting the Environment ... at the Cottage

Water quality (both groundwater and lake water) is emphasized in this section.

- Testing the Waters: Bacteria and Your Drinking Water (Getting safe drinking water from your well);
- Every Cottager's Covert Operation: Maintaining that Septic Tank System (How to run your septic tank system trouble-free for years);
- Keeping Aquatic Plants Under Control for Boating and Swimming
- Stop Old Age from Ruining Your Lake (Avoiding eutrophication of your lake);
- All the Dirt on Shoreline Alterations ("Do's and don'ts" of changing the natural shoreline);
- Gimme Shelter: Building Docks and Boathouses (Environmentally friendly structures). *

Environmental Living: Protecting the Environment ... in the Great Outdoors

This section will interest outdoors enthusiasts.

- Campfires and Cookouts (Fire safety);
- Could Swimming in Your Lake Make You Sick? (Diseases and parasites that affect swimmers);
- Great Lakes! The Zebra Mussel Story (The spread of zebra mussels in Ontario's waterways);
- Boating and the Environment
- Goin' Fishing: Should You Eat the Catch of the Day? (Contaminants and the consumption of sport fish). *



BEFORE YOU TAKE THE PLUNGE: RURAL LIFE IS DIFFERENT

Are you in the market for a cottage, hobby farm, or country property? Will rural life be a new experience for you? Congratulations. Rural living can be a rewarding experience. Swimming in a sparkling lake, spotting wildlife just outside your living room window, breathing fresh clear air, enjoying the tranquility — these are some aspects of rural life that make the inconveniences well worth it.

Wait a minute. Hold the phone. *What* inconveniences?

Well ... inconveniences such as pumping out the septic tank (gee, they didn't tell you there's no municipal sewage service in this neck of the woods?). Maybe you have to haul in your own safe drinking water twice a week (there's no municipal *water* supply, either). Perhaps you have to compost and dispose of your own garbage (nope, there's no curbside pickup in these parts, either).

Then there's the "you-can't-do-that" stuff you must observe if you want to keep the natural environment ... like not cutting back those weedy shrubs at the shoreline that interfere with your view of the lake ... or not fertilizing the lawn, because the fertilizer can contaminate lakes and streams and groundwater. Or you may find (*after* you've signed on the dotted line) that you won't be allowed to put in that heavy-duty dock for your brand-new boat, because it would ruin a fish spawning area ...

Hey, nobody ever said that living in harmony with nature came naturally!

Rural living is really about making compromises. It's about making adjustments in the way you do everyday things, so you fit into, rather than overwhelm, the surrounding environment. If you aren't

willing to make those allowances — do without those big-city amenities — then pretty soon that natural environment will disappear. And there goes the whole point of owning a rural property.

Some people mistakenly buy a country property thinking they can have it all — big-city conveniences plunked in a rustic setting. The truth is, nature is not that accommodating. *You're* the one who has to make allowances.

Do you really want to see wildlife at your back door? Then you should allow trees and shrubs to thrive in their natural state, so wildlife have habitat.

Do you really want to have fish to catch? Then don't panic about the aquatic plants in your lake — the ones that make it tricky to swim. They provide the fish with food and shelter.

Must you have absolute peace and quiet? If you expect it from your neighbors, you have to reciprocate — don't buy a speedboat or gas-powered lawnmower; instead, invest in a canoe and a push-mower, and put your own muscle-power to work.

And so it goes.

Before you start looking, think carefully about what you really want from a rural property. Do you want to be part of a recreational community along with lots of other active, growing families? Maybe a chalet in a semi-urban development would suit you.

Are you looking for a quiet area to retire to? Maybe an older, established community would be the ticket.

Are you looking for a rural retreat far from the city? Perhaps a property in Northern Ontario would fit the bill.

BEFORE YOU TAKE THE PLUNGE: RURAL LIFE IS DIFFERENT

Decide exactly what kind of rural experience you want. Then find the communities that already fit that profile.

Why take this approach? It's a lot easier, more realistic and more rewarding to find a setting that already suits your attitudes and lifestyle, than it is to change the *property* to suit *you*.

Be realistic — not only about your expectations, but about your own abilities. "Getting back to the land" may be a romantic ideal — but how far are you really willing to go? Do you really want to chop firewood and haul water?

Here are some points to ponder as you zero in on your expectations of rural life.

- *Are you prepared to provide your own basic services?*

Getting water, disposing of sewage and getting rid of garbage are the three human activities that have the biggest impact on the environment. In most urban areas, municipalities take care of these services for you; they may *not* provide them in the country. Here's what's involved.

The water you drink: If there's no municipal water service, you may have to bring in your own safe drinking water a couple of times a week. If you haul in treated water, it is only safe for a couple of days when it's refrigerated, then it has to be disinfected again. You'll have to learn how to do that.

You might consider constructing a well in order to supply your own drinking water. Keep in mind that if you try to construct the well yourself, your work has to comply with provincial regulations governing acceptable construction standards.

Remember, too, that groundwater is a public resource; your neighbors use it too, and you have to be careful not to contaminate it. That can happen, for example, through your septic system, by over-fertilizing your lawn, by using pesticides, or by poor construction techniques that allow potentially polluted surface water to seep into your well.

Another consideration: You may have to be careful about how *much* water you use, especially in summer when wells can run dry.

Your sewage system: Did you ever wonder what happens to the waste you flush down the toilet? If you're a city dweller, you probably never really thought about it. In the country, though, it's likely there's no municipal sewer system to whisk away your waste.

In fact, in the country, sewage probably doesn't get any farther than your own backyard — literally. Many cottages in Ontario use septic tank systems to handle and dispose of their household waste. Septic tank systems utilize a tank and a grid system of underground pipes to distribute separated liquid waste in the soil in your backyard.

That means you have to be mindful of what you flush down the toilet — it can affect your (and your neighbors') water supply. You have to maintain the septic tank system (not a difficult chore) and have the tank pumped out from time to time. You have to conserve water, so the system doesn't become overburdened. Eventually, you have to replace the system, because sooner or later, its ability to absorb, treat and naturally dispose of waste, will end.

BEFORE YOU TAKE THE PLUNGE: RURAL LIFE IS DIFFERENT

If you exercise some common sense, your septic tank system is hardly any bother. If you're *not* careful, though, you could end up polluting the land and groundwater with your own waste — *and* spending thousands of dollars to correct your mistakes.

Getting rid of garbage: Okay, if the local municipality doesn't pick up your garbage from the curb (what curb?) just what should *you* do with it? There's no better place than the cottage to practise the 3Rs — reduce, reuse, recycle. You can take what's left over to the local dump yourself, or take it back to the city for disposal.

The cottage is a great place to learn how to compost — you've got the space, the time and (if you've read this far) the inclination to do environmentally-friendly projects, and composting isn't hard. Just layer your waste (kitchen waste, yard waste, soil, in that order), and water and turn the pile occasionally. It's simple — but effective.

You end up with a rich organic humus to put on your lawn, flower and vegetable beds — so you can garden organically, too.

Read "A Down-to-Earth Guide to Composting and Vermicomposting" in *Environmental Living: Protecting the Environment ... in Your Yard and Garden*.

- *Are you prepared for the lack of social municipal services?*

Some of the services that may *not* be readily available in the area you're considering: Mail, library, public transit, utilities (such as electricity, telephone and heating fuels), emergency services such as fire-fighting and ambulance, schools and recreational facilities, television, hospitals and medical care, shopping. Also, if you want to build a road to get access to a remote property, there may be laws limiting the type of road that can be built.

Might there be plans to provide services in future years? What are the long-range plans for the area? Find out by checking the municipality's official plan. The official plan sets out the basic principles that guide the long-term development prospects for the area. For example, you may be looking to move into an area that's just starting to develop; the official plan will tell you if that's what's in store. Conversely, if you're looking to move to an area that's already established, and where no more development will take place, the official plan will likely tell you that, too.

Next, check the zoning bylaws for the area you're interested in. Be sure your intended use of the property is in line with the bylaws, which spell out exactly what's allowed. For example, you may be buying a property that you'll eventually "winterize" and retire to — check to see if the zoning is limited to seasonal residence only, or for year-round residence.

BEFORE YOU TAKE THE PLUNGE: RURAL LIFE IS DIFFERENT

- *Are you prepared to blend in with the neighborhood?*

It's true of any move to any neighborhood: Be prepared to accept — not change — what's already there. If you buy a property in a farming community, you can't very well complain about the smell when your neighbors spread manure on their croplands. If you're opposed to hunting, but it's a tradition in your new neighborhood, you're not likely to change local attitudes.

Ask yourself if you can see yourself fitting in with the people who already live in the area.

If you're looking to buy a cottage, one way to do this kind of research is to find out which cottagers' associations are active in the area, and contact them. The association's aims, membership and policies will give you a good indication of the attitudes of other property owners in the area.

- *Are you prepared to live closer to nature — and let it live closer to you?*

What it boils down to is that living environmentally — preserving those natural surroundings that make "cottage country" what it is — isn't hard to *do*, it just means exercising some vigilance and really *thinking* about the consequences of your actions.

Mostly, it means simply being careful about *not* doing certain things: Don't flush certain types of household waste down the toilet and into your septic tank system. Don't over-use water. Don't change the natural shoreline of your lakefront property (among

other benefits, the plants help control erosion). Don't fertilize your lawn — better yet, don't start one in the first place, just leave the landscape in its natural state.

What happens if you ignore these don't-do rules? You can contaminate your groundwater. You can ruin your drinking water supply. You will ruin your lake for swimming and fishing.

Rural living — environmental living — is largely a matter of live and let live. At the heart of it all is this simple maxim: If you avoid drastically changing the environment, it won't retaliate by changing in undesirable ways.

- *If Environmental Living is New to You....*

Read the rest of this series for more in-depth information on the topics covered here. The complete "Environmental Living" series is listed below.

Environmental Living:

Protecting the Environment

... *in Your Home*

... *in Your Yard and Garden*

... *when Building or Buying Your Dream Cottage*

... *at the Cottage*

... *in the Great Outdoors* *



BYLAWS AND BUILDINGS: UNRAVELLING THE RED TAPE

Pssst! Wanna buy some rural property, dirt-cheap? The land'll cost you next to nothing, so you have more left over to build the house of your dreams. Building bylaws? What building bylaws? These country burls don't worry about those kinds of details, don't give it another thought ...

If you're thinking about buying some land and building on it, don't sign anything — yet. It may be a country property, but that doesn't mean "anything goes" as far as what, how and where you can build. You've got to do your homework *before* you sign on the dotted line. It can save endless heartbreak later.

How do you find out about building, zoning and permits?

Land Use Planning and Official Plans

Perhaps you're already scouting around a general area, looking for the perfect site. And right *now*, the location seems ideal. But ... what will the area be like 10 years from now? Twenty?

Some cottage owners have watched in dismay as their quiet, isolated lakeside properties gradually evolved into suburbia over the years, as the area became more and more developed. And it was all perfectly predictable; set out decades ago right there in the municipality's official plan. Too bad most people don't bother to check.

Do you want to know if the area you're interested in is slated for vigorous development? Or conversely, are there *limitations* on building? You can find out by visiting the municipal office. Ask to see the official plan.

Official plans are policy documents that set out, in principle, the town's vision of the uses of its land. The official plan will give you a good clue as to the future of the location you're interested in. Is it pretty much going to retain its present character? Is it possible it will change drastically over the years? The official plan will tell you what kind of development is allowed.

Do you want to buy a large parcel of land now, with a view to severing it into smaller lots for sale later? Check if the official plan allows for this.

Official plans provide flexible guidelines on where housing, industry, shopping and other building will be allowed, and what municipal services (sewers, water, roads) will be extended to those areas. Be aware, though, that official plans aren't carved in stone. They can be amended.

Official plans are like maps. They show you the general lay of the land, but they don't give you step-by-step directions on how to get around. For that kind of specific detail, you need to check zoning bylaws.

Zoning Bylaws

Okay, so you've checked the official plan and you're happy with the future prospects of the neighborhood. Now you've found the ideal lot and you're ready to buy.

Let the buyer beware! Have you checked the zoning?

BYLAWS AND BUILDINGS: UNRAVELLING THE RED TAPE

The zoning tells you *exactly* what you can use that *specific* parcel of land for. It tells you what kinds of buildings are permitted and where you can locate them; it sets out such conditions as required parking; how large the lot must be; how tall buildings can be and how far back from the property line they must be.

Do you want to build a house on your land? Or farm it, perhaps? The zoning will tell you if you can do either.

Do you plan to build a summer cabin now, and gradually winterize it so you can retire to live there year-round? The zoning will tell you if residence is restricted to “seasonal use”.

Zoning bylaws can be amended, just as official plans can be. You can apply for a zoning amendment if you want to use or develop your land in a way that doesn’t comply with the existing bylaw.

Amending the zoning bylaw can be complicated — and it may not be necessary. If you want to put your lot to a use that almost, but *not quite*, conforms to the zoning bylaw, you can apply to the municipality for a “minor variance” instead of a change of zoning.

You apply for a minor variance when your intended use still essentially maintains the general purpose and intent of the bylaw and the official plan. A minor variance doesn’t *change* the existing zoning bylaw, it simply means the municipality allows your particular building project some relief from the specific requirements of the zoning bylaw. That way, you can get a building permit.

In addition to zoning bylaws (and there are a number of specialized zoning bylaws to control land use), municipalities can also apply site plan control bylaws to complement and refine the local zoning.

Site plan controls, for example, can be used to ensure new development blends in with existing nearby properties, or to ensure there is proper parking or landscaping on a new site.

Site plan controls are described in the municipal official plan.

Interested in Land in Northern Ontario? The Process is a Little Different ...

In some parts of Northern Ontario, land use planning may be handled differently because large parts of Northern Ontario are Crown land, or the area has no municipal organization governing local uses.

That doesn’t mean you can’t buy land, or that you don’t need a building permit. It *does* mean you have to go through different channels. You may need to contact, respectively, the local planning board, the local office of the Ministry of Municipal Affairs and/or the local office of the Ministry of Natural Resources.

The *planning board*, appointed by the Minister of Municipal Affairs, prepares official plans, just as an organized municipality does. Official plans (whether prepared by municipal organizations or by planning boards) must be approved by the Minister of Municipal Affairs.

BYLAWS AND BUILDINGS: UNRAVELLING THE RED TAPE

The *Ministry of Municipal Affairs* exercises the same responsibilities for an "unorganized" area as a municipal council does for an "organized" one. The minister can enact "zoning orders", which are similar to municipal zoning bylaws, in those areas. You can apply to the minister for a zoning order amendment or a minor variance for a Northern Ontario property, in the same manner you would apply to a municipality for one. Planning boards can be delegated to act on the minister's behalf in these and other matters.

The *Ministry of Natural Resources* is responsible for Crown (provincially-owned) land in Ontario. The MNR enforces laws regarding the use of Crown resources, including water, forests, fish, wildlife and minerals. Contact the local district office of this ministry if you are interested in developing or using Crown land. If yours is a waterfront property, and you want to do some work that affects the shoreline, you must apply to this ministry for a work permit (to find out how, read *Environmental Living: Protecting the Environment ... at the Cottage*).

Other Authorities to Check Out

So you've checked the official plan, the zoning bylaws (or minister's zoning orders), site plan controls — everything looks good and you're ready to buy and build.

Sorry, but there are still more governing bodies that might have concerns about, or place restrictions on, your building plans. Who else should you check with? Here's a list of some agencies that may have an interest in your plans.

Conservation Authorities are responsible for managing watersheds and are particularly concerned with floodplains. You may not be allowed to build on your land if there is a reasonable possibility that the land could flood. To learn which conservation authority is responsible for your area, check with the municipality or with the Ministry of Natural Resources.

As well, the *Ministry of Natural Resources* is concerned with protecting resources such as trees, wildlife, fish and public land. Some examples. The MNR protects important tree stands under the Trees Act; it protects important wetlands from being drained under provincial wetlands policy; it protects Crown (public) land and important fish habitat by requiring you to apply for a permit to alter the shoreline or build a dock or boathouse.

The *Ministry of Agriculture and Food* protects prime agricultural lands from incompatible uses through the provincial Foodland Guidelines.

The *Niagara Escarpment Commission* administers a development control permit system to ensure the escarpment is preserved as a natural environment.

The *Ministry of Culture, Tourism and Recreation* administers programs to preserve heritage properties and natural heritage areas.

The *Ministry of Environment and Energy* is concerned with water quality — both groundwater and surface (lake) water. To protect water quality, for example, the MOEE may advise a municipality it is opposed to any more development on some lakes, such as lake trout lakes, which are highly sensitive to environmental change. The MOEE (or, in some parts

BYLAWS AND BUILDINGS: UNRAVELLING THE RED TAPE

of Ontario, its delegate, the local board of health) is also responsible for issuing Certificates of Approval for your sewage system — and you need the certificate to get a building permit from your municipality.

This isn't an all-inclusive list, but it gives you an idea of the range of organizations that could have a keen interest in your plans for your rural property.

Now you can see how important it is to find out if the property you want to buy is "buildable".

Some buyers make the purchase of a property conditional on them being able to get a building permit, or a change in zoning. It's wise to hire a lawyer to investigate this and other legal implications of your purchase.

Getting the Right Permits

Whether you're building in the country or the city, there are certain permits that everyone needs, and building standards with which everyone must comply. You need to apply to the local municipality for a building permit. You must meet zoning bylaws and site plan controls. You must comply with the Building Code. You must have your electrical wiring inspected by Ontario Hydro.

There are *other* permits that you, as a cottage owner, need to be aware of.

You already know that you may also need permission from other authorities, such as conservation authorities and other provincial agencies. As well, if your property isn't serviced by municipal sewage lines, you'll need to install some means of disposing

of your waste. You must get a Certificate of Approval from the Ministry of Environment and Energy (or the local board of health) to install a sewage system. Only then should you apply to your local municipality for a building permit — no Certificate of Approval, no building permit.

The vast majority of Ontarians choose to install Class 4 sewage systems — septic tank systems. Read "This is a Story about Sewage. Skip It and You'll Be Sorry"; in this section, to learn how septic tank systems work.

Another permit is of particular interest to cottagers who own waterfront properties. If you want to build a dock or boathouse, erect a breakwall, create a beach or dredge a boat channel — anything that could alter the shoreline — you need to apply to the Ministry of Natural Resources for a work permit under the Public Lands Act. Read "All the Dirt on Shoreline Alterations" and "Gimme Shelter: Building Docks and Boathouses" in *Environmental Living: Protecting the Environment ... at the Cottage*. •



DIG A WELL TO TAP INTO GROUNDWATER SUPPLIES

Some things we just take for granted. Water's one of them. We turn on a tap, and presto, there it is — a constant, steady stream of potable water. We don't even think about it.

We don't think, either, about the *safety* of the water we drink. That's because it's virtually guaranteed — the water supplied to households in Ontario by municipalities has been treated to remove harmful amounts of bacteria.

What happens, though, when you buy or build a cottage or country home? What if the property isn't linked to a municipal water supply? How will you get water? You have several options.

Maybe having running water — at least for drinking — isn't a priority at your cottage. If that's the case, you can simply haul in containers of water from a known safe source. Your only worry then is being sure to store the treated water properly (bacteria can build up, even in treated water).

Perhaps your cottage overlooks a lake. If so, you might consider piping in your water. In Ontario, you can take water from a lake for ordinary household use without applying for a permit or paying a fee.

However, these "surface waters" are very easily contaminated and may be bacteriologically unsafe for drinking. To be sure, you need to disinfect the water you'll use for drinking once it's been piped in. As well, you should have the treated water tested regularly for bacteria. The Ministry of Health will test your surface water for bacteria — the service is free — but *only* if the water has been treated first.

To learn all out about bacteriological testing, read "Testing the Waters: Bacteria and Your Drinking Water" in *Environmental Living: Protecting the Environment ... at the Cottage*.

There's another way to get a reliable supply of good,

clean drinking water. Dig or drill your own well.

Well water is actually groundwater (water from underground sources). Two-thirds of the world's fresh water comes from below ground. In Ontario, 500,000 wells are being used.

Groundwater doesn't need much (if any) treatment because, coming from the ground, it isn't exposed to the same kinds of pollution and contamination that surface waters are. Mind you, you'll still need to test your well from time to time, as explained in "Testing the Waters", but a well could be your best choice for a reliable supply of safe drinking water.

Here's what you need to know about constructing a well.

Whither Your Water?

Once, drilling for water was an iffy proposition: You could drill several wells, and drill deep, and yet still come up dry.

Earlier generations of Ontarians resorted to "water witching" using a divining rod, but you don't have to. Today, you can predict with amazing accuracy where and how deep you'll have to go to find water. It's not "divining" — it's science.

Is water on your property? How deep will you need to go to find it? What type of well best suits the geology of your land? Will the water always be readily and reliably available, once you've found it?

You can find all this out because there are records of well-drilling activity. First, ask your neighbors and local well construction contractors (who must be licensed by the Ministry of Environment and Energy) about wells that have already been constructed in your area. Then contact the Groundwater Management Unit, Drinking Water Section, Water

DIG A WELL TO TAP INTO GROUNDWATER SUPPLIES

Resources Branch of the Ministry of Environment and Energy (40 St. Clair Avenue West, 11th floor, Toronto, Ontario M4V 1M2) for more "in-depth" information.

The Groundwater Management Unit keeps records of every water well in the province. Well contractors must submit water well records on every well they construct. The records will tell you what kinds of wells have been constructed in your area, how deep they were, the geologic material those wells were constructed in, how much water was found and what its quality was. Water well records are available for a small fee.

In addition to these very specific individual records, the Ministry of Environment and Energy can give you publications about the water resources in your area:

Water Resources Reports give detailed information on water resources in Ontario. Each report refers to a specific drainage basin.

Groundwater Probability Maps are county maps that give general information on water conditions, including the likely quantity of water you might get

from a well, how deep it might have to be and information on water quality based on actual water samples.

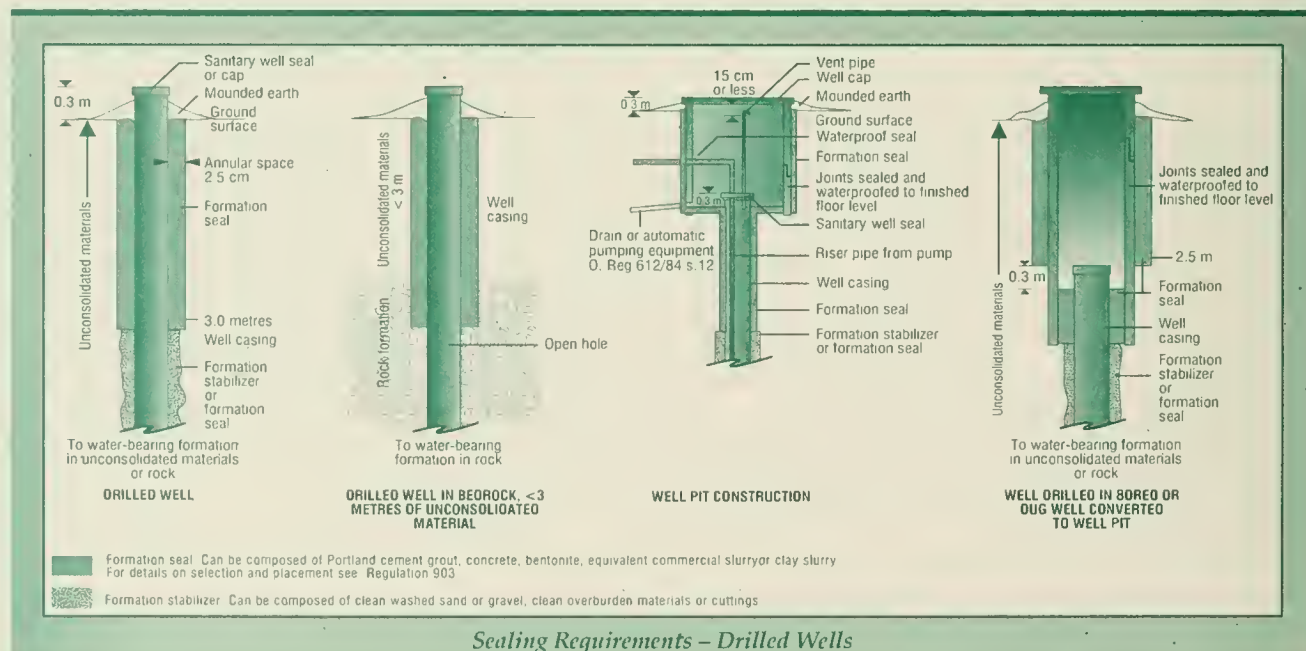
Major Aquifers in Ontario Maps show where important aquifers (geological formations that may be sources of water in usable quantities) are located in southern Ontario.

To get these publications, contact the Groundwater Management Unit at the address listed above.

What Type of Well?

The type of well you construct depends on the hydrogeology of your location. Here, they're listed in order of depth.

Dug wells are actually dug out by hand. If a dependable supply of water can be found on your property at a shallow depth (up to nine metres, or about 30 feet), a dug well may be the way to go. Other advantages of dug wells are that you don't need fancy equipment to build one, and following from that, dug wells suit otherwise-inaccessible sites.



Sealing Requirements – Drilled Wells

DIG A WELL TO TAP INTO GROUNDWATER SUPPLIES

One drawback of a dug well is that your water supply may dry up during the summer if there's little rain during the season. Another drawback is that shallow wells are extremely susceptible to pollution, such as farm runoff or discharge from your (or your neighbor's) septic system.

Bored wells can be constructed where the geologic formation is stable. They may be as shallow as 15 metres (about 50 feet) or as deep as 30 metres (or almost 100 feet). A bored well can quickly run out of water in a dry summer; such a well can also be recharged speedily if there is heavy rain or snow melt.

When you need a deep well, or must go through bedrock, you'll probably have to construct a *drilled well*. Drilled wells can be 15 to 60 metres (50 to 200 feet) deep, though they've been known to go as deep as 185 metres (or almost 600 feet). A well this deep is unlikely to be affected by pollution or cyclical changes to the water table. If your property is located in the Canadian Shield, which is mostly bedrock, then drilling may be the only construction method possible.

Where Should You Locate Your Well?

You can't just put your well down on any old place on your property. Hydrogeologic considerations aside, there are rules about locating your well:

- You should put the well as far away as possible from potential sources of pollution, such as septic tank systems, barnyards and roads.
- The well should be located on ground that's higher in elevation than the surrounding area (so surface pollutants don't collect in a puddle around the top of the well to seep into it).
- Put the well in a location where it won't be difficult or dangerous to do maintenance or repairs.

Don't, for example, put the well under a paved driveway.

- Plan where your well will be in relation to above-ground and underground structures, including buildings, utility lines and the sewage system. (To understand how a septic tank system can affect your water, read "This Is a Story About Sewage: Skip It and You'll Be Sorry", in this section. To learn how to work your septic tank system safely, read "Every Cottager's Covert Operation: Maintaining that Septic Tank System", in *Environmental Living: Protecting the Environment ... at the Cottage*.)
- Put in your well and install your septic system first — *then* build your house to accommodate *their* layout. (This is explained in detail in "This Is a Story About Sewage".)

Hiring Help

By now you may have concluded that this well construction business is better left to the experts. Whom do you hire, and how?

There are more than 800 licensed well contractors in Ontario. Contact your local district Ministry of Environment and Energy office (look in the Blue Pages of your telephone book) to get a list of contractors nearest you. Well contractors and well technicians (including pump installers) must be licensed by the ministry to work on water wells. When you hire these people, ask to see their licences.

Hiring someone to construct a well is like purchasing any other service; be a smart consumer. Ask for references. Get a contract. (Remember, though, the well contractor is unlikely to give you any guarantees about how adequate your supply of water might be, or about the quality of the water.)

DIG A WELL TO TAP INTO GROUNDWATER SUPPLIES

The well contractor *is* obliged to do certain things. Within two weeks of completing the well, he must give you a copy of the water well record, which sets out the well's location, your name as the owner, the date of construction, the geological log, the kind of water encountered (fresh, salty, sulphurous or containing iron or gas), well construction details, pumping test results, well yield, water use and a recommended pump setting. (The contractor must also give a copy of this record to the Ministry of Environment and Energy within a month of completing the well.)

The well contractor or technician must give you, the owner, a one-litre (almost one quart) sample of well water to check visually. The technician must also measure, in your presence, the exact depth of the well.

The contractor must tell you if the well is not in a sand-free state (when the well is located in sand, the sand will gradually plug the plumbing and wear out the pump; eventually, the well will fail).

The contractor must also disinfect the well before you use it for the first time.

The contractor must test the new well and record the rate at which water is withdrawn from the well, and record the water levels in the well during the pumping or recovery after pumping.

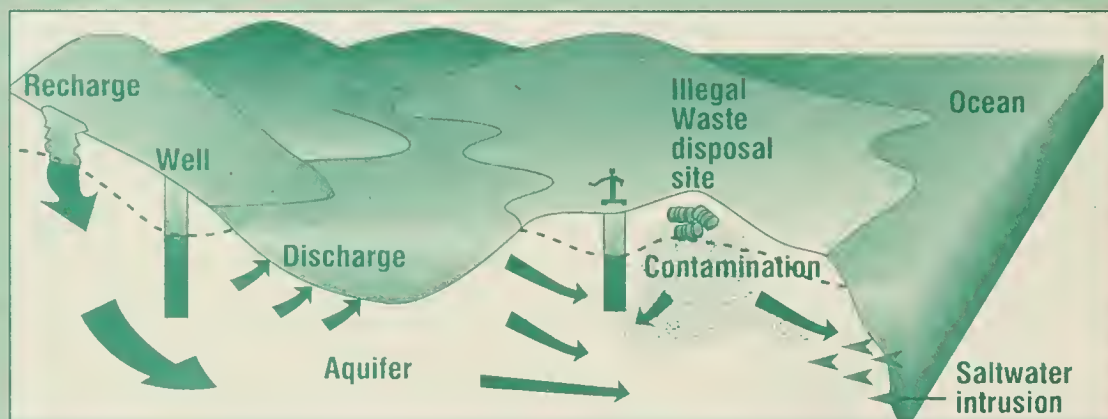
The contractor must also ensure that the finished well has been properly capped.

Pumping Water to Your Cottage

Choose the right pump for your well. Priming it and maintaining it, year in and year out, can be a tricky and frustrating chore. Be sure you understand and are capable of performing all the steps in the right sequence.

The pump, of course, is what lifts water from your well and delivers it to a pressure tank (which is most conveniently located in your basement). The three most commonly used types of pumps are the reciprocating (piston) pump, the jet pump and the submersible pump. They work differently, depending on whether yours is a shallow well or a deep one. Here, at a glance, are some of the major advantages and disadvantages of each:

Reciprocating pumps are very easy to prime, are less expensive than other pumps, and provide water at a constant rate and high pressure. However, they may be noisy; also, water is discharged in "pulses" rather than in a smooth flow.



Groundwater System

DIG A WELL TO TAP INTO GROUNDWATER SUPPLIES

Jet pumps are low in cost and easy to service, but if there's a leak in the line, they can be difficult to prime. If air or sandy water gets into the system, the pump won't work properly and can wear out prematurely.

Submersible pumps are quiet, efficient, and give you a smooth, even flow of water even if the water has to travel some distance to your house. Their major drawback is difficulty of repair; if a problem occurs, you have to call in the professionals to remove them from the well. Sand or gas in the water can damage or ruin the pump.

A Word on Keeping Your Well Healthy

When you rely on groundwater for your drinking water, you need to be aware of the many ways you and your neighbors may be inadvertently contaminating that groundwater. Take care. Be sure you're using your sewage system correctly. Don't over-fertilize your lawn. Mind how you dispose of seemingly innocent leftover household waste such as paint thinners, used motor oil and oven cleaners.

To find out how to conserve water and how to avoid contaminating the groundwater you drink, read "Water, Water Everywhere" in *Environmental Living: Protecting the Environment ... in Your Home*.

More for You to Read

If you would like to read up on drilling wells, hiring contractors, types of wells and pumps and water quality, the Water Resources Branch of the Ministry of Environment and Energy has prepared a 98-page booklet, "Water Wells and Ground Water Supplies in Ontario" to help you. It's included in the following list.

To order the Ministry of Environment and Energy publications in the list below, telephone the Public Information Centre in Toronto at (416) 323-4321 or toll-free at 1-800-565-4923. Please use the Public Information Bank System (PIBS) number to order publications.

Inquiries about the Environment Canada publications in the list below should be directed to the toll-free number 1-800-668-6767; or call the Toronto office at (416) 973-6467.

A Primer on Water. Questions and Answers. Booklet. Environment Canada, Conservation and Protection. ISBN 0-662-18582-X.

Clean Water - Life Depends on It! Fact sheet. Environment Canada, Conservation and Protection. Water 3. ISBN 0-662-17338-4.

Water - Nature's Magician. Fact sheet. Environment Canada, Conservation and Protection. Water 1. ISBN 0-662-18080-1.

Water Wells and Ground Water Supplies in Ontario. Booklet. Ministry of Environment and Energy. ISBN 0-7729-1010-3 WRB.

Water Wells and Groundwater Supplies: The Protection of Water Quality in Bored and Dug Wells. Information sheet. Ministry of Environment and Energy. PIBS 601b.

Water Wells and Groundwater Supplies: The Protection of Water Quality in Drilled Wells. Information sheet. Ministry of Environment and Energy. PIBS 602b.

Water Wells in Ontario: Important Facts about Water Well Construction. Brochure. Ministry of Environment and Energy. PIBS 587b •



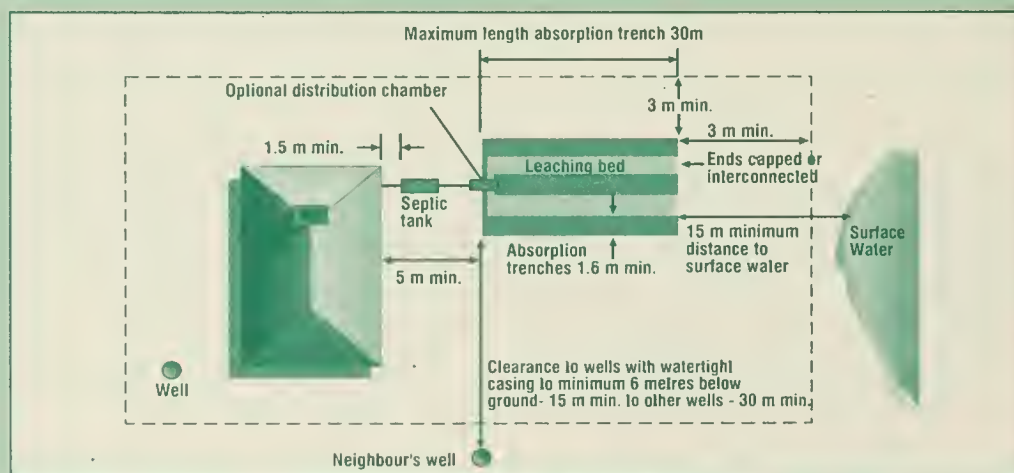
Probably the last thing you're thinking about is how to design your septic system.

Why? In many rural — and some urban — areas of Ontario, new homes are being built where no municipal water and sewage service is available. You'll have to provide your own water, dispose of your own waste — and in doing so, not interfere with your neighbours' water, sewage or property.

It's absolutely essential that your sewage system is installed, and works, properly. If you don't do this

But why *must* you design the sewage system first? For the system to work properly, you have to put in one with the right capacity, planning not only for your current, but also anticipating your *future* (that is, increased) needs.

You also have to meet minimum environmental standards. For example, the elements of the system must be laid out to allow for specified minimum distances between your septic system and other elements of your lot, including your house, your well, your neighbors' houses and wells and surface waters (such as a nearby lake or pond). Obviously, your site must be big enough to support the size and extent of your sewage system. Also, the septic tank itself must be a certain capacity.



Typical Arrangement of a Septic Tank System

THIS IS A STORY ABOUT SEWAGE. DON'T SKIP IT OR YOU'LL BE SORRY.

When you start to sketch all this out on a map of your lot, you'll suddenly see that the area that your sewage system needs is significant. Its design and layout will have a strong influence on where you situate the house itself, and how much land you can use for buildings, patios, driveway and all those other things you'd like to have in your dream house.

What may have seemed a huge lot with endless possibilities, now seems to be suddenly getting smaller and smaller.

So ... when you first put pen to paper to design your cottage, start with the septic system. Don't skimp. Don't under-estimate the capacity you'll need. Think ahead, 15 or 20 years down the road — will be you adding another bedroom? Living year-round at the cottage? Putting in a second shower? All these things affect your septic system. A few hundred dollars spent now can save untold worries later. For the sake of the environment, of public health and for your own peace of mind, plan ahead.

So where do you start?

If septic systems are new to you, read "Every Cottager's Covert Operation: Maintaining That Septic Tank System" in *Environmental Living: Protecting the Environment ... at the Cottage*. It describes how septic tank systems work and how to keep yours running problem-free for years.

Then, talk informally with the local municipal health unit. In most parts of Ontario, the health unit is responsible for reviewing your sewage system application. Assuming you're not doing the work yourself, line up a reputable licensed contractor, who will handle most of the red tape from here on in.

Here are the steps you (or the contractor) will take to get that all-important Certificate of Approval and get that septic system in the ground:

- *Submit an application for your septic system.*

The application consists of a list of fill-in-the-blank questions, and a request for a diagram of your lot. Expect questions such as: What type of system are you installing? Where? How many bedrooms will the house have? How many people? How many toilets? What and where is your water supply?

On the lot diagram, you'll have to show the layout of your proposed system. There's a diagram in this chapter showing guidelines for all those allowances (to lot lines, wells, etc.) you read about earlier; your contractor can advise you on the necessary capacity of your tank and the size of the leaching bed. (Your contractor will probably fill in this paperwork for you.)

Submit all this to the local municipal health unit (or the Ministry of Environment and Energy, in areas where there is no municipal organization).

- *Arrange for your lot to be inspected.*

Before the authorities come to inspect the lot, you'll be expected to stake out the property and dig a test hole about 1.5 metres (five feet) deep. The inspector needs that to assess the quality of your soil. The condition of the soil affects how well your proposed septic system will work. The inspector will also verify all the information in your application.

THIS IS A STORY ABOUT SEWAGE. DON'T
SKIP IT OR YOU'LL BE SORRY.

What happens if the site "doesn't work" for a septic system? All is not lost. Many septic systems have been installed on less-than-ideal sites. Your local health unit or the Ministry of Environment and Energy should be able to advise you, although not every "problem site" is solvable. (Keep that in mind when shopping for a cottage lot.)

A common modification to a traditional septic tank system is to build a raised leaching bed ("mounds") by bringing soil to the site. The new soil does the job that the site couldn't otherwise do. And the mounds are great as noise and bad-view barriers.

(The raised leaching bed option underscores the need to wait to design your house after the "must-do" features have been taken care of — if mounds are required, you'll want to take advantage of the landscaping options they offer.)

Once the inspector verifies your application, you'll get a Certificate of Approval. With that, you can go ahead and apply for your building permit.

- *Apply for your building permit and build the septic system and your cottage.*
- *Arrange for a final inspection.*

This must be done before your contractor backfills soil over your newly installed septic system, including the tank and the leaching bed. If your septic system passes the inspection, you'll get a permit to actually *use* the system.

If your septic tank system has been properly designed and installed, and you maintain it correctly, you can look forward to 20 years (and more) of trouble-free use — and that's if you're using your cottage year-round!

Eventually, every septic tank system has to be replaced. But by planning properly, right from the day you start shopping around for a cottage or country lot, you'll save yourself unnecessary aggravation and prepare the way for an enjoyable cottage experience.

More for You to Read

To order the Ministry of Environment and Energy publications in the list below, telephone the Public Information Centre in Toronto at (416) 323-4321 or toll-free at 1-800-565-4923. Please use the Public Information Bank System (PIBS) number to order publications.

Class 1, 2, and 3 Sewage Systems. Information sheet. Ministry of Environment and Energy. PIBS 600b.

Septic Tank Systems. Information sheet. Ministry of Environment and Energy. PIBS 599b. *



COTTAGE LANDSCAPING YOU CAN LIVE WITH

One of the pleasanter duties facing cottagers and country homeowners is surveying their domain and deciding what to do next to improve their property. "How about putting down a lawn this year?" "Let's clear out all the underbrush and dead trees in the 'back forty'". "Why not pull out all those ugly weeds at the edge of the lake so we can have an uninterrupted view across the water?"

Down through the years, the improvements add up — the cottagers put down a "proper" lawn, they clear away those dead trees and shrubs, they get rid of those weedy wildflowers in exchange for "real" flowerbeds.

But guess what happens? One day, they notice the lake doesn't seem to hold as many fish and amphibians ... the birds they *used* to see just outside the window, don't seem to come around anymore ... they can't remember the last time they caught sight of a wild animal out in the back forty.

And, to add insult to injury, it dawns on them that instead of relaxing and enjoying their country retreat, they're spending their time mowing the lawn, weeding those flowerbeds and watering the whole thing in a never-ending cycle of work, work, work.

Might as well move back to town.

How much *should* you change the natural landscape? If you want to have nature as near as your doorstep, the answer is: As little as possible. Your innocuous weekend projects can have a big impact on the soil, the water table and the lake or stream near your property.

For example, clearing away vegetation at the shoreline and building a dock can cause sediments to wash into the lake. That gives aquatic plants something to grow in and in turn, too many of them thrive, which in turn chokes out fish.

Similarly, the trappings of a modern household — things like fertilizing your lawn and using household products containing phosphates — can result in phosphorus — a nutrient — ending up in your lake, and that, too, causes excessive aquatic plant growth.

And when you get rid of shrubs and dead trees on your property, you're not just "clearing out a few scrubby plants", you're removing the homes, highways, and hiding places, of birds and animals.

Aw, c'mon, you may be thinking. These things are pretty small potatoes compared to big developments and subdivisions. After all, how much damage can one person do?

Not much. But multiply *your* weekend projects by all the projects that your *neighbors* also undertake. The cumulative effect means that before long, the natural amenities that attracted you to the rural life will soon be gone, probably forever. To find out more about how human activities affect the land and water, and what you can do to avoid inadvertently causing problems, read *Environmental Living: Protecting the Environment ... at the Cottage*.

So how can you landscape your property to *benefit* the environment?

COTTAGE LANDSCAPING YOU CAN LIVE WITH

Landscaping to Encourage Wildlife

If you enjoy seeing wildlife around your cottage, there's a lot you can do to encourage them to come around. You can (gently) manipulate vegetation around your property so a variety of birds and animals will visit. It's simple, really: The more diverse the vegetation on your property, the more diverse will be the wildlife that is attracted to it.

First, encourage different *types* of plant communities on your land and in the neighborhood. For example, in your general area, you might have an area of open field, some land containing brush and shrubs, a wetland nearby, some meadow and a stand of mature trees.

Second, in each type of plant community, you need plants that are at different stages of growth. (The tree stand, for example, should include young trees, mature ones, and both standing and fallen dead trees.)

When the habitat and food sources are diverse, the wildlife will be too.

Here are some hints on how to give wildlife a helping hand on your land:

- Wildlife need travel "corridors" and cover. Grow shrubs along the boundaries of fields, meadows and open lands.
- Mix your plantings so there's growth at all different heights — ground covers, shrubs, trees, so your land has what biologists call "vertical diversity".
- Let different plant communities overlap to give wildlife "edge". Don't parcel out your land with artificial separations such as fences or stone walls.
- Put in new plants regularly, so there's a mix of plants in terms of growth, height and age.
- Leave some vegetative debris lying around, such as dead trees (snags) and fallen dead logs that will gradually decompose. Wildlife can be very choosy about where they'll live, and snags and dead logs are home — the only home acceptable — to certain species, such as woodpeckers and eagles.
- Leave some open areas. Certain birds use cleared areas for mating rituals.

Shrubs for Wildlife

Trees and wildlife go together, but if your property doesn't have a lot of mature trees on it, don't despair. You don't have to plant seedlings or saplings and then wait a lifetime to get results. You can plant shrubs — which mature in a fraction of the time — they, too, attract wildlife of all kinds. Here are some of the best shrubs to plant:

Autumn Olive is one of the best all-round shrubs for wildlife, offering food to berry-eating birds such as robins, cardinals and cedar waxwings, as well as food for mammals such as raccoons and rabbits. This shrub is also very good for woodland borders.

Russian Olive is good for nesting songbirds such as cedar waxwing, robin and evening grosbeak. It offers cover to quail, grouse and ring-necked pheasant; deer and rabbit browse the buds.

Tatarian Honeysuckle grows in more densely, yet still retains its shape, if it is heavily browsed by herbivores. It's an excellent hedge.

COTTAGE LANDSCAPING YOU CAN LIVE WITH

Red Osier Dogwood provides food for more than 90 types of songbirds, and for deer, moose, rabbit and hare. It is good cover for grouse and woodcock. It's also useful to control streambank erosion.

Grey Dogwood attracts similar species to those that favor red osier dogwood. It can survive in dry, sterile soils.

Black Elderberry is food for 50 species of songbirds, for red squirrels, chipmunks and mice, and for rabbits, deer and moose.

Hawthorn is a low-maintenance shrub that provides food for 25 species of birds and is good for nesting.

Chokecherry provides food for up to 70 species of birds and for small mammals; it does well in sunny, well-drained soils.

Other shrubs to investigate because they provide food, habitat and "edge" for wildlife are highbush cranberry, silky dogwood, nannyberry, sumac, raspberry and pincherry.

Work with Your Site When You Landscape

If you want to "put down roots" at your cottage, you'll have great success if you plant vegetation that already grows naturally in the area. Indigenous wildflowers, shrubs and trees have adapted to the site (an adaptation that may have taken millennia); they already thrive in the soil, moisture and climate conditions around your cottage — so go with the flow and plant more!

The results will be entirely in keeping with your rural surroundings — and require very little work from you to keep up.

When planning a landscaping project, look around you. Do an inventory of all the features of the site. Are there naturally occurring boulders, slopes, berms, windbreaks? Work them in to your landscaping plan.

Consider, also, such factors as the amount of sun, wind, soil moisture, humidity, and the impact these factors have on how you use your cottage. Work with, or around, what you have.

Do you have a septic tank system on your property? You have to work around its layout. Remember, allow only grass to grow over the leaching bed, and don't park anything heavy — not even a snowmobile — on it. For more information on planning and planting around a septic tank system, read the chapter "This is a Story about Sewage. Don't Skip It or You'll Be Sorry".

Plants can be functional as well as ornamental. Some examples: You can plant a shelterbelt or windbreak so that, come winter, snow blows off the driveway. You can plant trees around your house to provide natural insulation — they will block out oncoming winds and at the same time, trap warm air. You can also plant trees so they'll shade the house in summer, yet let the sun in, in winter.

COTTAGE LANDSCAPING YOU CAN LIVE WITH

For advice on how to landscape to take advantage of the view, the sunshine and the natural features of your land, it might be worthwhile to get professional advice from a landscape architect or designer, or landscaping contractor. They can help you do an inventory of your land and assess the weather factors to take into account on your particular site.

Getting Help

If you're interested in keeping your cottage landscape as natural as possible, or in attracting wildlife to your backyard, there are plenty of like-minded people who share your enthusiasm. Ask around your area by checking local libraries, municipal offices and community centres. Ask about naturalists' clubs, cottagers' associations and gardening clubs.

Contact the Ministry of Natural Resources' district or regional office in your area (MNR is listed in the Blue Pages under "Government of Ontario"). This ministry sponsors a community wildlife involvement program that encourages individuals or groups to carry out wildlife management projects. Projects run the gamut from building nesting boxes for birds, to planting hedgerows and trees, to creating public education displays.

More for You to Read

To order the Ministry of Natural Resources publications in the list below, telephone the Public Information Centre in Toronto at (416) 314-2225.

Landscaping for Wildlife. Booklet. Ministry of Natural Resources.

Shrubs for Wildlife. Pamphlet. Ministry of Natural Resources. *



MORE FOR YOU TO READ

ENVIRONMENTAL LIVING:
PROTECTING THE ENVIRONMENT...

VOLUME 1
IN YOUR HOME

VOLUME 2
IN YOUR YARD AND GARDEN

VOLUME 4
AT THE COTTAGE

VOLUME 5
IN THE GREAT OUTDOORS

For copies of any of the above-listed volumes, contact:
Ministry of Environment and Energy
135 St. Clair Avenue West
Suite 100
Toronto, Ontario
M4V 1P5



Printed on Recycled Paper



MINISTRY OF
ENVIRONMENT AND ENERGY

